# Auburn University Syllabus CTSE7510

**Spring 2017**

**Professor: Dr. M. L. Russell**

**Course Title:** Research Studies in Area of Specialization: Secondary Science

**Credit Hours:** 3 semester hours

**Prerequisites:** Admission to departmental graduate program

**Class meeting times:** Thursdays 10:00-12:50pm

**Date Syllabus Prepared:** Revised January 2017

Professor: Dr. M. L. Russell 5004 Haley Center

334-844-6880

Office Hours: By appointment only Email: russeml@auburn.edu

I will respond to emails typically within 48 hours unless I am away from the office. If you do not hear back within 48 hours of emailing please send another email

# Students are required to check Canvas regularly for notes andimportant information. Please be sure to also check your AU email account regularly, as well. Please note the classmay also meet virtually via Zoom (online platform).

**Texts:**

Recommended: Holly, M. L., Arhar, J., & Kasten, W. Action Research for Teachers: Traveling the Yellow Brick Road (3rd edition)

# Additional Required Readings:

\*Readings and articles will be disseminated or placed on reserve in the library or LRC. You are responsible for reading all materials prior to the

class meetings and should be prepared to facilitate the group discussions on articles assigned. Lack of preparation and failure to have read assignments may result in point reductions from your final course grade.

# Course Description:

Review, analysis, and interpretation of available research, with emphasis on interpreting new research to meet the changing needs of science

teaching. Learn to recognize, use and apply results of both action and quasi-experimental research for the school environment. Research techniques will be discussed, with emphasis on their potential and limitations. Students will help write and defend a research proposal in their subject area. We will build and revise a model of how science learning occurs based on reading and interpretation of current research. We will examine how research has contributed to establishing national standards for classrooms.

**Course Objectives:** Upon completion of this course, students will be able to:

1. develop a model that explains how effective learning environments work with research that supports your model;
2. identify and use indices and other resources designed to help locate science research studies [ERIC, Dissertation Abstracts, other remote databases and library searching aids, and the internet.
3. learn to locate, read, and generalize from current research in science education - be a wise "consumer" of research;
4. learn to abstract research findings into a format easily shared with other science teachers; The instructor for the course reserves the right to make minor amendments to the syllabus or course as necessary.
5. describe those current national standards for science education that are derived from research and how research supports their implementation in your classroom;
6. identify current and probable future areas of promising science education research;
7. develop and defend a proposal to do research in an environment available to you.
8. address the issue of epistemology or knowing in research through: (a) study of different research paradigms in social science.
9. compare and contrast the two main methodologies in educational research.
10. be informed of some of the all-encompassing research findings on science learning.
11. become adept at using various library resources, as well as technology to learn about current research in the literature on science education.
12. develop a research proposal project on a specific classroom or school based issue in a particular area of interest in science education.
13. address issues of equity in science teaching.

# Cultural Diversity

“I don’t care that you know. I want to know that you care” Author Unknown

This course reflects the College of Education’s commitment to cultural diversity. The goal of professional education programs at Auburn University is to prepare outstandingeducators who are competent, capable, and caring in complex, diverse educational arenas. Such individuals are

Effective in their roles as culturally responsive teachers, designing and implementing sound meaningful and balanced instruction with the full range of learners. Effective as they assist learners in their comprehension of issues surrounding diversity; and

Effective in their contributions of thoughtful and informed discourse to their own educational communities as they work to build equitable and

supportive environments learners.

# Expectations

In this course I expect you to:

Reflect critically on all experiences and readings. Be prompt and in attendance at all course sessions.

Demonstrate critical reflection through discussion, writing and course assignments. Complete assignments to the best of your ability.

Communicate expectations and ideas.

Recognize and validate the values of other class members.

# Course Requirements Participation

This class is intended to be both interactive and collaborative. You are expected to come to class prepared to discuss assignments. We may also designate small groups during the initial class session, and you will spend some time doing group work. Learning is most effective when we fully participate in the process of constructingknowledge. In this course it is my expectation that everyone actively participate. Participation starts with preparation. It is my expectation that each class participant will be fully prepared for each day by having read the assigned materials and completed other work requested and required.

# Please note that this is a course that moves quickly andstudents are expectedto come prepared. The format of the course is discussion and student centeredand the instructor promotes more student-student interaction.

**Late/remedial work policy**

No late assignments unless in accordance with AU missed work policy (i.e. excused absence) and at the discretion of the instructor of the course.

# Grading policy

General grading rubric for assignments

100%: beyond the call of duty; strikingly impressive; excellent in every

way 90%: both complete and showing evidence of original, active, critical thought 80%: all specified aspects of assignments minimally completed

<80% one or more aspects of assignments missing or unacceptable

# Grading S cale:

A 92%-100%

B 80%-91%

C 70%-79%

D 60%-69%

F <60%

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| --- | --- |
| **Course Evaluation**Your final course grade will be based on the following:**Assignments** | **Points** |
| Article overview and presentation (2) | 10 |
| 5 pop quizzes (5 points) | 25 |
| Midterm exam | 30 |
| Final Exam | 30 |
| Outreach Field Experience at Forest Ecology Preserve 5 hours | Required |
| Reflection paper on outreach field experience | 5 |

**Please pay special attentionto specific course assignment due dates**. There will be no late assignments accepted unless in accordance with AU policy for missed work (i.e. due to an excused absence). Some class meetings will entail a discussion of a featured chapter from the assigned readings. You are expected to have read assigned readings or assigned articles and bring prepared notes to use in contributingto class discussion. You may be invited to lead this discussion.

# Article overview paper and presentation guidelines

* 1. **You are to complete a slide presentation andturn in a minimum1 page SS overviewof two articles (5 points each). Each article overview, a copy of the article, andthe presentation (PREZI) will be and uploaded to Canvas on the assignment due date.**

**Students are to use Prezi andat least 5 slides to present the “essence” of each article presented. See guidelinesbelow:**

* + 1. **Slide presentationshouldinclude: Overviewof research article that includesa) purpose for study, b)research methodology, sample selection technique, andsample size, c) data collection techniques anddata analysis, d) major themes andfindings, conclusion, e) howthis adds to existing literature**

**(The slide presentation does not have to be as detailedas the online paper submission)**

* + 1. **Article overview assignment (5 points)**

**Overview of research article guidelines for online paper submission**

**-purpose for study (1 point)**

**-research methodology, sample selectiontechnique, andsample size (1 point),**

* **data collection techniquesanddata analysis (1 point),**
* **major themes andfindings, conclusion,(1 point)**

**-how this adds to existing literature (1 point)**

**\*Please do not rewrite the article. Attach a copy in PDF format of the article to Canvas with this assignment.**

Format:

1. Scan the article, and post the article, PREZI, and overview to Canvas assignment postingno later than 30 minutes prior to the class

meeting time/due date for the assignment and attach the assignment to Canvas as well. All assignments are to be turned in electronically. If there is no postingfor the assignment on Canvas then students are to email the assignment no later than 30 minutes prior to the class meeting time for the due date of the assignment.

1. All articles must be from research journals and no articles prior to 2005.

# Please do not rewrite the article or article abstract. This overviewshouldbe in your “own voice”. The overview turnedin online as a paper shouldbe more detailedthan the PREZI. The overview of the article selectedshould be on “hot topics” in science education (preferably). Articles can address equity, technology in the science classroom, ELL in the science classroom, or any other recent topics in science and STEM education. Students will present the article give a brief overview and answer the aspects listedbelow. 2 at 5 points each (10 points total).

**Please uploadthe article citationat least one week prior to the due date so I can be sure that each student has a different article for each assignment. Please select a different article than classmates have done for the secondarticle overview and presentation.**

**Each student has 10 minutes to conduct the presentation and 5 minutes of class discussion.**

You will select 2 articles an provide an overview and presentation for both articles. Each overview is worth 5 pts. Please select an article based on something you are interested in learning more about in science education. Below are some examples of journals you may use. Each article you

provide an overview and presentation on should address hot topics and challenging issues in the area of science and STEM education. All

assignments must be typed, single-spaced and in APA style 6th edition. You may select an article from the following suggested journals:

*Science Teacher Science Scope*

*Journal of Science Teacher Education Journal of Research in Science Teaching Science Education*

*School Science and Mathematics*

Additional journals that may address issues related to science and science education may include:

*Review of Educational*

*Research Journal of Negro Education Journal of Counseling Psychology Journal of Teacher Education Educational Researcher*

Preferably the article should relate to current issues related to science education. Please let me know if you have difficulty locating articles.

# There will be 5 Pop quizzes: 25 points total (5 points each quiz)

There will be 5 unannounced pop quizzes at 5 points each. (25 pts). These pop quizzes will be on assigned readings and discussions in class

# Midterm exam: May include short answer, description format. More details to be provided prior to exam. 30 points

1. **Final exam: May include short answer, description format. More details to be provided prior to exam. 30 points**
2. **Outreach Fieldexperience hours at Forest Ecology Preserve (5 hours)**

Students are required to document and complete at least 5 field experience hours at the Forest Ecology Preserve with Mrs. Jennifer Lolley. Further information will be provided when she visits the class for an orientation meeting.

## *Mandatory Outreach experi en ce (5 hours) must be compl eted by Apri l 27*

There is also an outreach experience component where you are required to conduct outreach work with the Forest Ecology Preserve. Please make sure that you complete a fingerprinting/background check with Professional Ed. Services.

Mrs. Jennifer Lolley will be your contact person and she will meet with our classes to discuss the outreach experience please let me know and I can make some arrangements for you. It is mandatory to tell me where you will be doing the

outreach experience before you begin. You must make arrangements and inform me of what you will do for the outreach hours no later than Feb.15. After you complete the hours you must provide documentation of outreach detailing what you did and the coordinator of the program must signature your participation.

## *Docu men tati on of outreach experi en ce i s due on the l ast cl ass meeti ng date of Apri l 27*

1. ***Outreach refl ecti on paper. (5 poi nts)***

Students will write a minimum 2 page single-spaced reflection paper on their outreach experience and the paper must include the following:

* 1. What insights do you have now on teaching in the informal setting based on this experience?(1 pt)
	2. What will you do in your own classroom to integrate more informal science opportunities for your students? (1 pt)
	3. What did you do as part of your outreach hours and how has this helped you improve professionally? (1 pt)
	4. What teaching strategies did you think work best in the informal setting and why? (1 pt)

***5.*** Provide a brief overview of what you did for your outreach hours at the Forest Ecology Preserve. (1 pt)

## *Pl ease note i f you atten d di fferen t outreach experi en ces you can wri te or address the questi ons i n the context of the the overal l experi en ce and*

**Course Content and Schedule:**

# Week 1 (January 12)

## *Overview of course*

Get acquainted. Discuss syllabus and course objectives. Discuss resources available for this course.

# Week 2 (January 19)

Action research and its value for improving classroom teaching. Attempt to define effective teaching, and build a working model for how it works: inputs and outputs. Discussion on action research. Students are assigned to look up the term action research and begin working on a literature search for topics they are interested in learning more about relative to STEM or Science Education. Conducting a study; Introduction, literature review- SLO-5

# January 19-February 1 Drop Course penalty days (See AUAcademic Calendar) Week 3 (January 26)

Students are assigned to look up the term action research and begin working on a literature search for topics they are interested in learning more

about relative to STEM or Science Education. Conducting a study; Introduction, literature review-SLO-5

Library research day/students will work in the LRC only: Students are assigned to select a research interest that is a problem in science education or STEM education. What is your research interest? Why is this a problem? How would you investigate this topic? Why does it interest you?

Students will present the responsesto these questionsin class on February 9. Students will also work on their article presentation due February 9.

# February 1 15th class day

**-Last day to drop from course with no grade assignment**

**-Last day for potential tuition refundfor dropped classes**

**Week 4 (February 2)**

**Article overview and presentation due-Must be on an action research based topic in STEM or S cience Education**

Conducting a study; literature review, statement of the problem (SLO

1-5) IRB procedures and protocols; Ethic in research Ethics in research

Data collection; Sampling strategies

What can educational research tell us about effective science teaching? Discuss action research and its value for improving classroom teaching. Investigate current research on effective teaching in the science classroom, and build a working model for how it works: inputs and outputs. Discussion on action research.

Discussion on action research

# Week 5 (February 9)

Conducting a study; literature review, statement of the problem (SLO

1-5) IRB procedures and protocols; Ethic in research

# Week 6 (February 16) Midterm Exam

**February 23 Early alert midterm grade Week 7 (February 23)**

Continue independent research on topic of interest in STEM education (more information to be provided). Students will provide an overview for the class on M arch 9

# March 2 Midsemester 36th class day

**Week 8 (March 2)**

**Article overview and presentation due-Must be on an equity issue in STEM or S cience Education.**

Ethics in research

Data collection; Sampling strategies

Data collection

**Week 9 (March 9)** Data collection Data analysis

# Week 10 (March 13-17 S pring break)

**Week 11 (March 23)**

Data reporting

# Week 12 (March 30)

Data reporting

# Week 13 (April 6)

Data reporting

# Week 14 (April 13)

Data reporting

# Week 15 (April 20)

Overview of research topics discussed Writing and reporting

# Week 16 (April 27)

**Last day of class/semester wrap-up**

## *Outreach refl ecti on paper due*

**April 28 (last day of the semester) Classesend**

April 29-30 Study/Reading Day

M ay 1-5 Final Exam Period

M ay 6-8 Commencements

# Final exam CTSE7510-See AUfinal exam schedule for day and time of exam which will be based on CTSE7510 meeting day/time.

**Class Policy Statements:**

Participation: Students are expected to participate in all class discussions and participate in all exercises. It is the student’s responsibility to

contact the instructor if assignment deadlines are not met. Students are responsible for initiating arrangements for missed work. The instructor for the course reserves the right to make minor amendments to the syllabus or course as necessary.

\*Traditional Masters students- Please note that traditional Class A certification students will be required to complete a field project and 30 clock hours of field experience hours as a requirement for this course.

**Attendance/Absences**: Attendance is required at each class meeting. If an exam is missed, a make-up exam will be given only for University-

approved excuses as outlined in the student eHandbook. Arrangement to take the make-up exam must be made in advance. Students who miss an exam because of illness need a doctor’s statement for verification of sickness and should clear the absence with the instructor the day they return to class. Other unavoidable absences from campus must be documented and cleared with the instructor **in advance**. Attendance is mandatory and participation is paramount for success in this class. You are responsible for attending all class sessions. In the event of an emergency (or something pretty close to it) please make every effort to notify me in advance (prior to the class meeting). You are required to contact the instructor personally in advance for the absence via e-mail, telephone, or leave a message with the administrative asst.

M ary Lin, or Elaine Prust in the Dept. of Curriculum and Teaching (844-4434) if you are unable to contact me personally in the event of an emergency. Each absence may result in a five point deduction per absence. After three absences students will be recommended for withdrawal from the class. Should an extended illness or family emergency arise please notify your instructors as soon as possible. In the event that there is an absence it must be in accordance with AU policies on absences in order to be excused. Please remember that assignments are still due, in the event that you are absent. Attendance is mandatory. \*Please arrive at each class on time (10:00 am) and be prepared to discuss and respond to

issues and topics covered in the class. Excessive tardiness will not be accepted and two tardies (more than 10 minutes late) will be considered as one absence and will result in a 5 point deduction from your final grade. Moreover, late students may not be permitted to enter class and may be counted as an unexcused absence at the discretion of the professor of the course.

\*If you miss a class, you are still required to turn in the assignments on time for full credit. Please contact me prior to turning in your assignment

via e-mail as an attachment only. In the event that you are have an excused absence in accordance with AU’s excused absence policy all

assignments must be turned in no later than 3 days after the date you miss class. Preferably, unless you have a medical emergency make every effort to turn assignments in on the date that they are due even if you have an excused absence.

# Unannouncedquizzes:There will be 5 unannouncedquizzes.

**Accommodations**: Students who need accommodations are asked to arrange a meeting during office hours the first week of classes, or as soon as possible if accommodations are needed immediately. If you have a conflict with my office hours, an alternative time can be arranged. To set up this meeting, please contact me by e-mail. Bring a copy of your Accommodation Memo and an Instructor Verification Form to the meeting. If

you do not have an Accommodation Memo but need accommodations, make an appointment with the Program for Students with Disabilities at 1244 Haley Center, 844-2096 (V/TT).

**Professionalism**: As faculty, staff, and students interact in professional settings, they are expected to demonstrate professional behaviors as defined in the College’s conceptual framework. These professional commitments or dispositions are listed below:

# Engage in responsible and ethical professional ethics; Contribute to collaborative learning communities; Demonstrate a commitment to diversity; Model and nurture intellectual vitality.

There may be some class meetings that utilize Canvas and entail on-line discussions or live chat discussions.

Students are required to log in and participate in all discussion. Failure to participate will be considered an unexcused class absence and result in a 5 point deduction from your final grade for each time that you fail to participate.

* \*Traditional Masters students- Please note that traditional Class A certification students will be required to complete a field project as a requirement for the program. More information will be provided to students who are completing the traditional masters.

All assignments are expected to be typewritten, grammatically accurate, and free of spelling and typographical errors. Assignments are to be of a quality that would be expected of a professional.

***All assignments must be turned in within ten minutes of the start of class on the day that they are due or within ten minutes of the time identified on the syllabus.*** They must be submitted as a hard copy or via email or Canvas unless otherwise specified. Assignments must be turned in by the student completing the assignment.

**No late assignments** will be accepted unless accompanied by a university approved excuse. All absences must be in accordance with the AU absence policy in order for the absence to be excused and late work to be accepted based on the absence.

If a student misses turning in an assignment and has a university approved excuse, he or she will have **one week** from the time he or she returns to class to turn in the assignment.

# Any assignment completedand /or submitted not in accordance with the guideline in this syllabus may be returnedand may not be accepted for credit.

**Please note**: Any incomplete assignments or assignments not typed up in the proper format will not be accepted. All papers must be in 12 font, Times New Roman, and single-spaced.

All submitted work should be typed and neatly arranged. NO creative margins. Please start all assignments at the very top of the first page and put your name, assignment, and date on the very last page.

# Late/remedial work policy

If you miss a weekly class, you are still required to turn in the assignments on time for full credit. NO late assignments will be accepted unless students have an excuse in accordance with the AU absence policy listed in the AU online guidelines. **All assignments are due via Canvas at the start of each class meeting on the date they are scheduled.**

**Honesty Code:** The University Academic Honesty Code and the Tiger Cub Rules and Regulations pertaining to Cheating will apply to this class. “As members of the academic community, students are expected to recognize and uphold standards of intellectual and academic integrity. The university assumes as a basic and minimum standard of conduct in academic matters that students be honest and that they submit for credit only the products of their own efforts. Both the ideals of scholarship and the needs for fairness require that all dishonest work be rejected as a basis for academic work.” (AU Bulletin) Any questions related to academic honesty will be subject to the Policy on Academic Honesty as stated in the Auburn University Bulletin.

**Classroom Behavior:** “Behavior in the classroom that impedes teaching and learning and creates obstacles to this goal (learning) is considered disruptive and therefore subject to sanctions. Students have the responsibility of complying with behavioral standards…Examples of improper behavior in the classroom (including the virtual classroom of e-mail, chat rooms, telephony, and web activities associated with the courses) may include, but are not limited to the following: arriving after a class has begun; use of tobacco products; monopolizing discussion; persistent speaking out of turn; distractive talking including cell phone usage; audio or video recording of classroom activities or the use of electronic devices (including cell phones) without the permission of the instructor; refusal to comply with reasonable instructor directions; employing insulting language or gestures; verbal, psychological, or physical threats, harassment, and physical violence. “ (See *AU guidelines available online)*

Classroom Behavior: The Auburn University Classroom Behavior Policy is strictly followed in the course; please refer to the Student Policy eHandbook at [ht t p ://www.auburn.edu/st udent \_info/st udent \_policies/](http://www.auburn.edu/student_info/student_policies/) for details of this policy.

Students are responsible for checking class emails and Canvas daily, if you use email or Canvas. You are to use your AU official email address only for all correspondence with the instructor for the class.

# Cell phones may NOT be used during this class. Placing or receiving calls, text messages, instant messages, or emails may result in immediate dismissal from the instructional sessions. Failure to adhere to the policies for this class will result in the student being dismissedfrom the class meeting.

**Academic Honesty Policy:** All portions of the Auburn University student academic honesty code (Title XII) found in the *AU guidelines* will apply to university courses. All academic honest violations or alleged violations of the SGA Code of Laws will be reported to the Office of the Provost, which will then refer the case to the Academic Honesty Committee. Honesty Code: The University Academic Honesty Code and the AU ehandbook Rules and Regulations pertaining to Cheat ing and all Academic Honesty policies will apply to this class. All portions of the Auburn University Student Academic Honesty code (Title XII) found in the Student Policy eHandbook at [ht t p ://www.auburn.edu/st udent \_info/st udent \_policies/](http://www.auburn.edu/student_info/student_policies/) will

apply to this class. All academic honesty violations or alleged violations of the SGA Code of Laws will be reported to the Office of the Provost, which will then refer the case to the Academic Honesty Committee.

**Student Academic Grievance Policy:** The purpose of this university policy is to “resolve academic grievances of students, which results from actions of faculty or administration. This resolution should be achieved at the lowest leave and in the most equitable way. The burden of proof rests with the complainants.” See *AU Guidelines* for steps towards redress.

# Auburn University’s official Contingency

**Plans will apply to this course in the event of emergency, etc. Justificationfor Graduate Credit**

Graduate courses “should be progressively more advanced in academic content than undergraduate programs” and should “foster independent learning” (SACS guidelines 3.6.1 and 3.6.2).

Factors to consider in evaluating a course for graduate credit include but are not limited to the following:

use of specific requisites; content of sufficient depth to justify graduate credit (materials beyond the introductory level); content should develop the

critical and analytical skills of students including their application of the relevant literature; rigorous standards for student evaluation (all students in a 6000-level course must be evaluated using the same standards); course instructor must hold graduate faculty status or be approved by the Dean of the Graduate School.